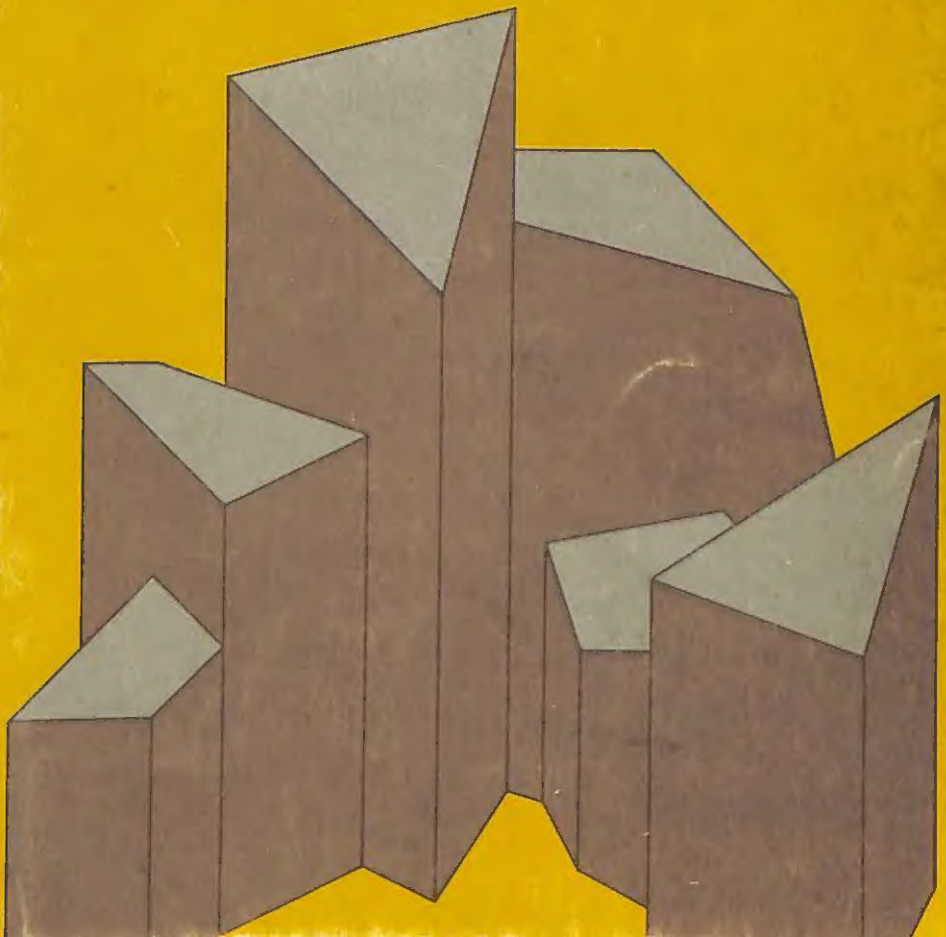
Experiments and innovations
in education 2

The school readiness project



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EXPERIMENTS AND INNOVATIONS IN EDUCATION

This series is published in English, in French and in Spanish

Titles in this series:

1. The TEVEC case
2. The school readiness project

Experiments and innovations in education No. 2

The school readiness project

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Preface

The IBE has been defined as a centre for reflexion in the field of comparative education. To be valid, however, such reflexion must find its practical application in the education systems of Unesco's Member States - who, indeed, pay for it. In other words, the IBE's role is to contribute to educational development and improvement; and in order to do so, it is essential to start from a clear knowledge of the process of innovation. The purpose of this series of case studies is to provide educators in Member States with objective accounts of important innovations, for study and possible adaptation, and as matter for reflexion on the nature of educational change. It is hoped that some indication of the effectiveness with which this purpose is fulfilled and of the future direction the series may take will be provided by an analysis of replies to the brief questionnaire inserted at the end of this publication. Readers are therefore requested kindly to complete it and return it to the International Bureau of Education, Palais Wilson, 1211 Geneva 14, Switzerland. All remarks, criticisms and suggestions will be welcome.

Evidence of world-wide awareness of the social, educational and psychological implications of early childhood education emerged clearly from the work of the 33rd session of the International Conference on Education, held in Geneva in September 1971. Despite diverging opinions regarding the feasibility of providing such education, it was generally agreed that this was essentially the age-group in which social or cultural disadvantage could be tackled effectively. Educational provision for this age-group was severely limited, however, and possible ways of enrolling children earlier called for investigation.

Professor Okoń's paper describes in detail the research phase of an innovation, the broad aim of which is to serve the best interest of Polish children of pre-school age. An investigation of these children's ability to cope with the school situation with which seven-year-olds are normally faced confirmed the hypothesis that certain children are in fact mature enough to enrol before the statutory age.

Research on school readiness had taken place sporadically over the past forty years and indeed progress had been made with early enrolment, which was a clearly felt need, but inadequate data had prevented the establishment of any national criteria. Professor Okoń therefore set out to define criteria for school readiness and to find adequate measurement techniques. The resulting test, in Polish and with English and French translations, is available in microfiche form for any specialist wishing to form a first-hand opinion. The second phase of this work is directed towards 'reorganizing educational functions at the beginning of school instruction so that an equal start is provided for all'. There is no inference, however, that any long-term benefit will necessarily accrue. The research findings will be taken as a basis for early enrolment and, subsequently, for determining what should be required of children enrolled early.

Although the innovation itself has yet to be effected, Professor Okoń's research, with its incidence on educational structures, content and methods, is clearly innovatory. In terms of Mr. Huberman's paper[1], it conforms to the 'research and development' model. Further, comparable investigations are called for, however, before any theoretical conclusions may be drawn concerning the nature of innovation.

Professor Okoń, born in 1914 in Poland, took his doctorate in education and psychology at the University of Łódź. He is Professor of Education at the University of Warsaw and, since 1961, has been Director of the Institute for Education. He is a member of the Committee of Educational and Psychological Sciences at the Polish Academy of Sciences and has spent some time in the United States and Great Britain as a Ford Foundation research professor. His published works include *U podstaw problemowego uczenia sie* (Principles of problem learning, 1964) and *Podstawy wykształcenia ogólnego* (Foundations of general education, 1967).

Professor Okoń has served as a member of the IBE panel on educational innovation, which met in Geneva in 1971 and 1972, and he prepared this paper as part of the work of the panel. The Secretariat wishes to express its gratitude to him for undertaking this work.

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1. Huberman, A.M. *Understanding change in education: an introduction.* Paris and Geneva, Unesco : IBE. (Experiments and innovations in education, No. 4) [To be published shortly]

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Introduction

1. RESEARCH PROBLEM

Social progress and rapid advances in science and technology create new, constantly growing requirements for mankind today. It would be more than misguided to expect that requirements in the year 1990 or 2000 will not be much greater than those of the present day. Perhaps the most important of these requirements is the ability to keep up with all the changes occurring in the surrounding reality and at the same time to participate actively in their implementation. Rapidity of change will call for a higher level of intelligence, for a new way of thinking and acting, and this can by no means be achieved through traditional methods and forms of education. It is thus indispensable to make the present system much more effective or to find ways of modernizing it.

Attention given to pre-school education can serve as a good example of endeavours in this direction. Investigations in this field, initiated in a number of European and American countries, are leading to the enrolment of more and more children in various forms of pre-school education. In consequence, a new theory of pre-school and early school education is being formed which is gaining widespread acceptance all over the world.

It had long been held that pre-school education applied merely to the child's social, emotional and physical development. Belief in the spontaneity of a child's natural development was reflected in the almost infinite freedom of the child's activities, which were therefore non-instructional in character. The new theory, without neglecting emotional, social and physical development, emphasizes the child's cognitive development, concept formation, speech habits and thinking processes.

Recent research in the field of psychology and developmental pedagogy has shown that the traditional idea of delaying a child's cognitive development till school days is no longer tenable. It was demonstrated beyond any doubt that the intellectual curiosity appearing between the ages of 2 and 7 opens vast possibilities of

influencing a child's cognitive process and his over-all intellectual development. If no educational influence is exerted in this period, there is little chance of ensuring full development later. Gifted children are most often those who were lucky enough to be brought up in a favourable environment that enabled them to utilize the optimum learning period. Slow learners, on the other hand, prove to be those brought up in a less favourable environment which contributed to the accumulation of their developmental shortcomings. According to the new theory, maximum development of a child's cognitive abilities, as well as compensating for environmental differences, favours not only intellectual but also emotional development, since no failure is then encountered either in kindergarten or in the primary school.

It therefore seems obvious that, in order to provide all children with full possibilities of over-all development, objectives, teaching content, methods, forms and strategies of pre-school education must be changed. This calls for experimental work on pre-school education at various stages of the child's development and full implementation of the most effective measures. This stage of implimentation becomes more and more important, since although research on the subject has been carried out, little innovation has been introduced in educational practice.

At this point, significant differences between educational research and educational innovation can be noted. Research consists in finding adequate answers to questions raised, the answers usually revealing important relations between variables. The final product of research is thus the discovery of new links between facts or processes, and the resultant understanding of various aspects of education and may lead to innovation. Innovation itself, on the other hand, is 'any change affecting a part or the whole of an education system and bringing about an improvement in the working or the output of the system. Such changes may bear on the structures, methods, strategies and goals. When these changes are gradual and spread over a period of time, they may be termed renovation rather than innovation. When they take place directly and within given time limits, they may be termed actual innovation. This innovation may be far-reaching or superficial. It may be total or partial (affecting the whole of the education system or parts of it).'

While innovation as defined here is a change leading to the improvement of the education system or of any part of it, it is the research that, as a rule, determines the direction of changes. The

direction and character of change constitute the crux of an innovation and determine its success. In the innovation presented in this paper, research certainly played this important role, being the first phase of innovation activities. In the second phase, conditions were created for its implementation, while the third phase was the implementation itself. This strategy corresponds to the first of the three models to be presented by M. Huberman [1973], i.e. that covering research, development and diffusion.

The project described here concerned school readiness, its measurement and levelling. The research dealt with two problems: first, the measurement of school readiness in a representative sample of Polish children, then the yearly evaluation of school readiness in every child six months before entry to a school which would compensate for children's inequalities. For reasons mentioned above, emphasis has been laid on intellectual developmnet.

2. GENERAL REMARKS ON SCHOOL READINESS

School entrance requirements seem crucial for educational theory and practice today. Attempts have long been made to list components of school readiness. In the initial phase, research concentrated on the determination of the child's intellecutal readiness to take on school obligations (H. Winkler and K.Penning of the German school). Somewhat later, research was started on the social readiness of the child (Ch. Buehler, L. Schenk-Danzinger of the Viennese school). Comtemporary psychologists consider that the process of maturation results from the interaction of development and learning, a view which creates new perspectives for the study of school readiness. In the light of this theory, answers should be sought to the following questions:

1. What are the elements of school readiness?
2. Which of these elements are distinctive?
3. What didactic activities should be undertaken to help the child so that, at a certain age, he is mature enough to face school responsibilities?

Some of the latest studies carried out in Austria (L. Schenk-Danzinger, F. Holzinger), the Federal Republic of Germany (the International Institute for Educational Research in Frankfurt-am-Mein) in the Soviet Union (A. Gorbaczova, A. Lublinska) and in Sweden (Bror A. Johansson) aim at stating what school readiness is, what it is conditioned by and how it can be attained.

In Poland, research on school readiness has been conducted intermittently since 1931. Although both Winkler's and Sancte de Sanctis's tests were used, no scheme was sufficiently prognostic. At the same time, attention was drawn to considerable differences between children entering school. Consequently it was postulated that compensatory classes should be organized for children who are not ready for school instruction (M. Grzywak-Kaczyńska) and the so-called early enrolment introduced (H. Radlińska). This early enrolment was to take place several months before the actual beginning of school learning in order to determine the level of a child's intellectual and social maturation and to ensure that assistance was provided for those who revealed weaknesses. Both ideas have been implemented on a large scale since 1960, starting from the city of Łódź where, in February, early enrolment was introduced first to one primary school (A. Majewska) and then to the others. Boards of educational centres for in-service teacher training, educational advisory centres and institutions of pre-primary education expressed interest in the idea and gave aid to teachers.

The success of the campaign depended, however, on the positive attitude of schools and parents as well as on proper organization. Most of the teachers found early enrolment useful and voluntarily started compensatory activities. As a result of the efforts of kindergarten and primary school teachers the action was successfully continued in several regions (Kielce, Katowice, Lublin, Łódź, and Warsaw). In a number of cases, however, teachers were discouraged from attending in-service courses to prepare for the action, and then the early enrolment was entrusted to teachers of higher grades or to school secretaries and carried out immedidately before the summer holidays. This made compensatory activities completely ineffective. Most of the difficulties resulted from the lack of rules and regulations concerning various organizational aspects of the campaign. Obstacles were numerous but the action did make teachers and researchers aware of the significance of school readiness problems. Detailed medical, psychological and logopaedic examination of children in the region of Puławy revealed that 22 children out of every hundred showed considerable weaknesses, while about 3 per cent were suspected of mental deficiencies. In the sample of 1,843 children, as many as 388 needed compensatory instruction.

Justified conclusions, valid for the whole of the country, were, however, impossible, since both methods and criteria for evaluation differed considerably. The following can only be inferred from data obtained in 1970: (a) About 95 per cent of children are brought for

an extended psychological examination, (b) only about 75 per cent of the children show sufficient school readiness (75 per cent in the Kielce and Puławy region, 75 per cent in the Włocławek region, 71 per cent in the Rzeszów region, 77 per cent in the Łódź region and 72 per cent in the city of Łódź). The scope and range of experience gained from early enrolment made it possible to identify urgent needs which had not been met in the existing education system. Since the child's future school success is strongly determined by his school readiness, it proved indispensable to construct school readiness tests which would help to point out children with an insufficient degree of intellectual, social, emotional or somatic development. It was also necessary to provide adequate aid for these children, so that the differences could be levelled and an equal start ensured for all. Researchers from the Warsaw Institute for Education were the first to initiate activities in this field since, as a main research centre attached to the Ministry of Education, the Institute deals mainly with research directed towards improving the education system. Its two sections, concerned respectively with the general theory of instruction and with initial instruction, participated in the early enrolment operation from the outset, giving aid to schools and teachers involved in compensatory activities.

In order to decide on the research design, efforts were made to collect data on how needs of this kind are being satisfied in other countries. Information was scarce, however, and such school readiness tests as could be found were of doubtful reliability, while research was undertaken only occasionally and on a small scale. Interest in the problem was constantly rising all over the country and no delay could be afforded. It was finally decided by the director of the Institute that the Section for the General Theory of Instruction under the guidance of Dr. Barbara Wilgocka-Okoń would start research on a national scale. The research plan of the Institute for Education was thus extended by one additional item entitled 'Research on School Readiness' (1967-68) with the following annotation:

'Research on school readiness aims at summing up the campaign for early enrolment in grade I of the primary school. In several kindergartens and schools, experiments will be conducted in order to define criteria for school readiness and find adequate measurement techniques. Application of the criteria to research on six-year-olds will show what percentage of children are mature enough to take on school responsibilities. Phase I will be completed by the end of 1968. Phase II will concentrate on ways of reorganizing educational functions at the beginning of school instruction so that an equal start is provided for all.

I. Experimental procedures

1. DISCUSSION OF PROBLEMS

The question of when the child should start school learning can be answered only through research, which would point out the most propitious moment for taking on school responsibilities. School readiness is thus defined as the child's attainment of a degree of physical, intellectual and social development sufficient to enable him to fulfil school requirements and to assimilate the curriculum content. The dual character of this definition, which refers to the child himself, on the one hand, and to the school and its requirements, on the other, is an indication that much attention should be given both to the teaching material and to the methods used. School responsibilities are determined by the educational policy and by the existing curricula. In the first period of school learning the child is expected to master reading, writing and arithmetic. This is usually done in a group of peers guided by the class teacher in a specially designed place, to which the child must adapt both socially and physically.

Learning to read and write requires a number of skills without which the desired level of achievement cannot be attained. The question arises: what kind of skills are they and what are they conditioned by? In the process of reading and writing, three elements are usually distinguished: visual, i.e. perception of graphemes, auditory skill, corresponding to perception, and semantic skill, which consists in associating graphic symbols with meaning (Zborowski, 1959). Each of the elements in turn involves a number of skills. The child must, for instance, differentiate shapes of graphic symbols. This is, however, impossible without the skill to compare, recognize and, in the case of writing, to copy various symbols. Here a number of difficulties arise, as some of the letters are similar in shape. Small differences accompanied by striking likenesses give the most difficulty. The child upon entering school should, however, be able to recognize and differentiate highly similar and only partly different symbols. Problems are also unavoidable

in the field of reading comprehension, which is closely connected with the over-all acquisition of the language and the level of concept formation. As far as writing is concerned, proper analysis of graphic symbols is of great significance. Without it, the child is unaware of all the component elements in the grapheme and thus unable to copy the letter. Therefore two kinds of activities can be distinguished: perceiving the shape and drawing, both of which require visual analysis and synthesis as well as the motor development sufficient for copying.

In the study of arithmetic or, rather, mathematical thinking, not only conceptualizing quantitative features in sets is required but also understanding relations between sets, e.g. more, less, equal. In order to define these relations the concept of correspondence must be formed. What proves indispensable is also the ability to carry out reverse mental operations of a practical character as well as skills to classify sets.

If the child is to feel at ease in school and adapt to the organization of the educational process he must show emotional balance and social maturity. Failing this, proper educational influence will not be exerted. A high level of physical maturation is also desired, since school responsibilities will prove overburdening for a weak child.

In conclusion, the skills and abilities which go to make up school readiness can be summarized as follows.

Learning to read and write requires the ability to perceive and copy simple graphic symbols.
The study of arithmetic requires understanding of basic relations and concepts.
For the general course of school learning, an understanding of the surrounding reality is indispensable.
For proper social functioning, the ability to act in a group is necessary as well as that of understanding and complying with the teacher's instructions.
For physical activities such as coming to school and going home, sitting at the desk, or playing with other children, a certain level of somatic and motor development is needed as well as the proper functioning of the body.

2. PRESENT-DAY TRENDS IN RESEARCH ON SCHOOL READINESS

The research design prepared in the Institute for Education is conditioned by the understanding of relations between maturation and

learning, i.e. between genetic and environmental factors. There is still controversy regarding the relative influence of these factors, although arguments are still lacking which would definitely confirm either point of view.

It is more and more often stated that maturation is not conditioned by hereditary factors only, this theory being considered progressive. Thus, in the present paper, by maturation we mean the developmental process in which a considerable role is played by imitation, drill and learning. Maturation and learning are, therefore, treated as two mutually complementary developmental components. The unity of the two factors is strongly stressed in Soviet psychology. As early as the thirties, L. Wygotski questioned the widely held opinion that the child's development and achievement were determined by the maturation of psychic processes. He was the first to state that the human environment and learning as a systematized form of interaction with adults are fundamental in the formation of the human psyche. Thus, learning and acquisition of human experience are considered basic for over-all development. It is only the forms of learning that change with development (Wygotski, 1956). The thesis was then supported by many other Soviet psychologists, who claimed that perception, memory, attention and thinking are the foundation of the learning process as well as its product.(Rubinsztejn, 1962). They also stress that speeding up the development of mental operations in children is possible only with a through knowledge of the child's capabilities since, in the growth of ontogenetic features, periods of higher and lower effectiveness of drill can be distinguished (Leontiew, 1962). The approach to development as conditioned both genetically and environmentally through teaching, upbringing and the child's own activeness has a strong bearing on the general design of research on school readiness.

3. RESEARCH OBJECTIVES

Research was focused on three problems. Firstly, it aimed to discover reliable methods of evaluating school readiness. Secondly, relations were to be stated between the child's developmental level and environmental conditions, so that abilities to gain individual experience could be predicted. Thirdly, forms of educational activities in the pre-school period were to be examined, in order to find those most effectively stimulating developmental processes.

Research objectives can be summarized in three fundamental questions:

What is the level of school readiness in six- and seven-year-olds?
What is the source of achievements and shortcomings in the field of school readiness?
What are the relationships between school readiness and living conditions?

Research concentrated primarily on intellectual readiness, although basic features connected with both social and somatic readiness were also taken into consideration. Examination of intellectual, social and physical maturity was carried out against the background of environmental factors (social prestiege and the amount of education in parents, living conditions as indicated by the size of the home, number of persons in the family, access to radio and televison set or separate places for work and learning).

It was assumed that considerable differences between these factors would be revealed when comparing urban with rural regions, since the environment indicates the type of work, the amount of education and income. The present stratification of Polish society, being free from class divisions, forms a hierarchy of occupations and of posts within each occupational category. Changes in stratification patterns did not, however, abolish differences in developmental opportunity of children upon entering school. The analysis of environmental factors was followed by a study of influence exerted by educational institutions. Relationships between school readiness, age and sex were also examined. Finally, research aimed at stating the impact of school readiness on the future school success of the child. Although school success is influenced not only by the level of intellectual, social and physical maturation but also by the type of educational activities in school, it was assumed that school readiness of the child upon entering school ensures success in the performance of learning tasks.

4. RESEARCH METHODOLOGY

In order to examine skills that constitute school readiness it was decided to construct (a) a test which would measure a child's intellectual development, (b) a questionnaire to obtain environmental data and (c) an observation card systematizing remarks on the child's behaviour in a group of peers.

The test was to be used to evaluate intellectual development in six- and seven-year-olds and to state its influence upon school success. Factor analysis of the maturation process was carried out in order to ensure proper selection and grading of various groups of test items. Generally speaking, items included in the test measured the level of performance with respect to:

recognizing objects, sets and symbols as based on comparison, differentiation and classification,
formation of elementary mathematical concepts,
cause-effect thinking,
copying symbols with a varying degree of abstraction.

The questionnaire pertained to basic information concerning the child's living conditions so that interdependencies between school readiness and environmental factors could be stated. Questions were grouped in three categories, those pertaining to the child itself, to other members of the family and to financial conditions at home.

The third instrument, viz., observation card, included remarks on the child's attitude toward instructions and duties, his self-reliance and success in group interaction. Data obtained from the observation card helped to state the degree of socialization. In the attitude toward instructions and duties, sub-elements were distinguished, i.e. understanding and obeying instructions and perseverance in working. As regards self-reliance, entering a group and interaction within the group were analysed. Six specific questions were also distinguished with a corresponding three-point scale, e.g. in understanding and obeying instructions the following categories were used:

(a) full understanding (the child understands the instruction and carries it out without seeking aid),
(b) incomplete understanding (the child waits for additional explanation or asks questions),
(c) no understanding (the child does not understand the instruction and seeks aid in solving the problem).

The child scored one point if the understanding was full, half a point if incomplete and 0 if lack of understanding was accompanied by inability to solve the problem. In the field of social maturity the subject could score from 0 to 6.

All the measurement instruments were tested for validity and reliability in the course of the pilot study which was carried out on the sample of 63 children from both and urban regions. Examinations covered children aged between five and a half and seven and

a half years. The sample for the pilot study corresponded to that drawn for the actual research. Thus, 35 urban children were examined, 20 of whom attended kindergartens, as well as 28 rural children, 8 of whom attended kindergartens.

The first version of the test included 62 items which measured comparison, differentiation and identification of symbols as well as ability to classify and memorize. Several items tested the level of cause-effect thinking, one of the items consisted in telling a story on the basis of a series of pictures and three others in sequencing pictures illustrating a story. There were also items testing analysis and synthesis, copying, comparing sets, etc. All the items were graded according to the degree of difficulty, from the easiest to the most difficult.

Both the level of difficulty and the discrimination index were computed for each item on the basis of date obtained in the pilot study. The average difficulty was kept at the level of 70%, so as to ensure the optimum reliability. Internal reliability of the test, which was calculated by means of the Kuder-Richardson's formula, proved to be sufficiently high (0.90). The first version was modified, by rejecting items that were too easy or too difficult as well as those which revealed high discrimination according to the environment. The final version included 44 items, 33 of which were suitable for group testing (set 1) and 11 for individual testing (set 2).

5. RESEARCH RESULTS

With the large body of data obtained through testing it is possible to state the level of school readiness in six- and seven-year-olds as well as to analyse the impact of environmental factors on overall development. In the processing of the data three groups of children were distinguished according to age (a) children aged 6, (b) children aged 7, and (c) children aged six and a half. The third group was added to the first two as it was assumed that this group is the most representative for the proper school starting age.

The level of abilities in all three groups is presented in table 1. Comparison of average results can help to decide whether Polish six-year-olds are mature enough for school learning.

Table 1. Number of children N and the mean score x

Environment	5:9-6:8		6:3-7:2		6:9-7:8	
	N	x	N	x	N	x
Urban	226	32.2	245	34.5	237	36.6
Rural	290	24.9	305	27.7	308	31.0
Total	519	28.1	550	30.7	545	33.4

Thus there is a marked difference in achievement of six- and seven-year-olds from the urban area (32.2 :36.6). The same holds true for those from the rural area (24.9 : 31.0). Differences are smaller between children aged seven and six and a half (34.5 : 36.6 in the urban area and 27.7 : 31.0 in the rural area). Differences between the two groups are more significant according to environment than according to age, which proves that environmental influence and developmental stimuli are of great importance. Figures presented in the table are no more than a description of the present state of school readiness in Polish children. This state however, can be modified through the proper organization of planned educational influence exerted by institutions of pre-school education.

Data were also processed so as to state the correlation as between school readiness on the one hand, and age, environment, sex, kindergarten attendance, etc., on the other. The analysis pertained both to separate items and to the test as a whole. Table 2 shows mean scores on the whole of the test.

Data summarized in the table reveal the strong influence of environment on readiness. Prominent environmental differences between urban and rural children were found (r_{bis}=0.35). Out of 44 items in the test, 37 reveal very significant and 7 significant correlations. Differences of this kind are much greater than those between age groups, since r_{bis} calculated for extreme groups (six-year-olds and seven-year-olds) was 0.26.

Differentiation of items according to age was found in 20 items, 13 of which revealed high statistical significance.

Sex was not stated to be a differentiating factor (r_{bis}=0.06). Only in a few items did girls perform better.

The problem of pre-school education and its influence on the child's intellectual development can be considered important for rural children (r_{bis}=0.17). No significant differences were found between urban children attending kindergartens and those staying at home.

Table 2. Scores on the test in percentages, differences and the statistical significance of differences

Children	Number	Result in percentages	Difference	Statistical significance
total	1072	70.4	-	-
6:8-7:8	597	75.2	10.8	0.26
5:9-6:7	475	64.4		
urban	472	78.6	14.6	0.35
rural	600	64.0		
boys	518	69.1	2.6	0.06
girls	554	71.7		
urban: kindergarten	257	80.3	3.6	0.12
non-kinder-garten	215	76.7		
rural: kindergarten	69	74.3	11.6	0.17
non-kinder-garten	531	62.7		

6. ASPECTS OF SOCIAL DEVELOPMENT IN SIX- AND SEVEN-YEAR-OLDS

Comparison of children attending the kindergarten with those staying at home revealed a considerably higher level of social development in the kindergarten children. The extent of the difference was evident in the field of understanding and obeying instructions. The mean score of the kindergarten children was 37.2, while non-kindergarten ones scored 30.8 on the average. Perseverance in work was also more marked in the kindergarten children (35.2 as compared to 30.0). It was observed that the kindergarten child demonstrated a greater ease on entering a peer group (35.0 : 30.6); this was also true for the social interactions (35.2 : 30.0). The influence of the kindergarten education was less marked as regards self-reliance and adjustment to the new situation (33.2 for kindergarten children and 30.1 for non-kindergarten ones).

In the group of rural children, the impact of the kindergarten was stronger than in the group from the big town environment. Especially when it came to understanding instructions, the rural children attending kindergarten were evidently superior to those brought up at home.

7. SCHOOL READINESS AND SCHOOL SUCCESS

School readiness should not be measured merely through research on the intellectual, social and physical development of the child. The true evidence of it lies in his success at school. This success in turn is determined by school requirements as expressed in curricula, handbooks and the whole system of educational measures undertaken by the teacher on the one hand, and the pupil's abilities on the other. Comparison of the two groups of elements reveals one of the following patterns of interrelationships:

the pupil's abilities enable him to take on school responsibilities,
school responsibilities exceed the pupil's abilities,
the pupil's abilities are not fully utilized in the course of learning.

In order to state which pattern of interrelationship is the most common, researchers from the Institute for Education started the evaluation of educational achievement six months after the administration of the school readiness test, i.e. in February 1969. Research covered 469 seven-year-olds, all of whom were tested for school readiness in 1968. Testing materials pertained to reading, writing and arithmetic, i.e. to three skills fundamental to initial instruction. Reading tests concentrated primarily on reading comprehension. The writing test consisted in copying two short interrogative sentences and providing answers to both of them. The knowledge of arithmetic was tested by several items such as "Give an example of two numbers, the sum of which makes 10".

Data thus obtained served as an indicator of school success. A minimum of full school success was assumed to be indicated by 66.6 percent of correct answers, while 33.3 percent were taken as an indication of a minimum of a partial success. Results are presented in table 3.

Table 3. School success in seven-year-olds (in percentages)

	School success	full	partial	no	total
Urban	number	183	17	4	204
	percentage	90	8	2	100
Rural	number	202	51	12	265
	percentage	76	19	5	100

The table shows that school success is more common among children in the big town environment, although environmental influence is not the only factor of school success. Considerable differences between urban and rural children were evident as early as on the school readiness test, and it was the lack of school readiness which could bring about school failure.

The significance of school readiness for school success was assessed by stating the correlation between the two groups of data. The analysis revealed evident influence of school readiness on school success, since the value of the correlation index amounted to +0.51. An additional test was also provided by measuring the correlation between the scores on the school readiness tests and grades obtained during the first six months of school learning. The value of the correlation index amounted to +0.52. Both values are high enough to conclude that the intellectual development of the child is of great significance for his future school success.

II. Implementation of the project

1. CONSEQUENCES OF THE RESEARCH PROJECT FOR EDUCATIONAL PRACTICE

The report prepared in the Institute for Education on the course and results of the research was transmitted to the Ministy of Education. The work on the project did not stop at this point, however. Activities were initiated to implement innovation in all primary schools throughout the country. Fortunately, no social obstacles appeared. Immediately after the publication of the research results in the educational press, numerous individuals and even the local centres for teaching methods applied for permission to use the school readiness test. In consequence, the Institute published about 12,000 copies of the test and about as many again were later published by the centres. The test became extremely popular both because of its high prognostic value and its relative practicality. In the years 1969-1971 the test was commonly used in early enrolment, while observations carried out in various schools helped the researchers to improve the body of instruction.

In these circumstances the Ministry of Education appointed a Committee of Experts to state whether the test was suitable for wider use. After a detailed examination the Committee approved the test, suggested its further popularization and urged that decisions concerning the earlier school start be speeded up. The Committee announced a decision to introduce the school readiness test as an obligatory measurement accompanying early enrolment. Among other postulates advanced by the Committee the most important pertained to establishing educational centres in regions where kindergartens are hardly available so that deficiencies were remedied before school was started.

Quicker implementation on modernized curricula for grades I, II and III was recommended as well as prolonging the school day and modernizing school equipment. The Committee suggested that several classes for six-year-olds should be organized in order to carry out detailed psychological and educational observations.

2. REACTION AGAINST INNOVATION

The new method in the measurement of school readiness elicited, as usually happens in cases of educational innovation, a number of both positive and critical remarks and met some reticence on the part of researchers, school administration, teachers and parents. Reaction against the innovation focussed on the research problem, on the administration of the test and on the teachers' preparation for its wide utilization.

The strongest criticism came from those psychologists and teachers who had so far used older and less reliable methods of measurement and from researchers who opposed testing itself. Precise measurement of children's achievement is still a highly controversial problem. The most common source of negative attitudes toward testing was the faulty attempts to use tests in the measurement of school readiness some years ago, when the essential requirements for starting school satisfactorily were treated as inflexible, constant and unsusceptible to any educational influence. Older school readiness tests measured several abilities connected with speech development. This led to discrimination against children coming from less favourable types of social environment which did not permit them to develop a vocabulary appropriate for their age. Against this background a general mistrust toward testing appeared and especially toward testing in school. Attitudes of this kind had a strong bearing on the reaction of psychologists and teachers against the innovation.

Presently, however, some changes in attitudes toward testing can be noted. Although a critical approach to psychological tests is still preserved, achievement tests designed for schools of various types and levels meet interest and approval. Much emphasis is given to the fact that faults ought to be ascribed to interpretations of results rather than to the tests themselves.

Reaction against the innovation on the part of psychologists on the staff of vocational and educational advisory centres resulted from tests being administered by primary school teachers. Two factors were here stressed. Firstly, developmental measurement had hitherto been carried out merely by advisory centres which not only considered more complicated cases but also initiated small-scale researches on school readiness, using the method of guided observation. Secondly, psychologists from the centres stressed that no primary school teacher is able to administer the test and interpret scores properly. Opponents tried to influence decisions of the Ministry in order to prevent wider usage of the school readiness test.

Measures for implementation of the project prepared in the Institute for Education elicited some negative reaction not only among psychologists but also in the Ministry of Education. Some employees of the Ministry disapproved of it and stated that all the efforts of advisory centres and individual teachers who initiated activities connected with the early enrolment and compensatory activities should also be given prominence. This was, however, practically impossible because of the lack of precise data on the children's development, whereas the Institute worked on well-processed statistical data obtained through testing on a representative sample of children.

Fortunately, trials made with the test in several primary schools spoke in its favour. In some regions of the country the test was circulated among primary school teachers who then started to use it in accordance with the accompanying instructions. The opinion of teachers and school inspectors was that the test was practical and extremely easy to administer. It was also found helpful in assessing the degree of intellectual and social development, grouping children with the same level of maturation and organizing compensatory activities. It was the opinion of local educational authorities that finally brought about the decision of the Ministry to issue an ordinance concerning the popularization of the test in early enrolment. The ordinance stressed that all the children should be examined by means of the test, the observation card and the social questionnaire.

This decision renewed negative reaction of psychologists who used the guided observation method for stating school readiness. The ordinance, however, permits the use of either method i.e. testing or guided observation. The difference between them lies merely in the precision of measurement, since many psychologists consider tests to be samples of precise observation. In the year 1958 the American Psychological Association suggested the following definition: "a psychological test is nothing more than a precise observation of actual behavior in standard conditions".

Full implementation of school readiness measurement required the proper preparation of schools and teachers. The task was to be carried out by centres for teaching methods, educational advisory centres and local school authorities, i.e. all the institutions staffed with specialists able to organize teacher training.

It was generally expected that the mass campaign would encounter numerous difficulties, the most important of which were considered to be: ensuring proper testing conditions; replacing the teacher

engaged in testing activities in his every day school duties; the time-consuming aspect of measurement.

By and large, however, school readiness measurement was enthusiastically accepted by the majority of teachers. This can be explained by the urgent need to state the level of children's maturation and define their standard of achievement. Moreover, great interest was also noted on the part of heads in kindergartens who wanted to measure educational influence.

One of the teachers in a small-town primary school writes as follows: "...Tests prepared in the Institute for Education played an important role in the life of the school. The introduction of tests gives more significance to the entrance examination; gives a considerable emotional experience to the child; brings parents closer to the school; and permits the teacher to get to know the child both individually and against the background of the group, so informing him how to approach the teaching of reading and writing".

This does not mean that testing was accepted without any reservation. While researchers opposed the very method of stating school readiness through testing, teachers' reservations concerned some details of administration, such as the wording of instructions in the test, the type of items, punctuation, time allowance.

Reaction was thus elicited by the standard conditions of test administration. Changes in the wording of instructions were called for, since some children did not understand them either because they were not acquainted with the meaning of several expressions, e.g. "improper", "the same amount", or because they used dialects at home. One of the teachers writes: "Children using dialectal varieties of the language and unacquainted with educated speech did not understand the instructions I gave them. While the Institute obviously cannot prepare alternative versions of instructions for various regions of the country of for different dialects, testing strictly according to the wording of instructions would yield scores lower by 40-50 per cent".

Criticism of various test items often resulted from the teacher's experience gained in the course of early enrolment. Opinions concerning the items differed considerably according to types of schools and types of social environment. Thus, the same item was considered by some teachers to be too easy and by others too difficult.

Many reservations were expressed regarding evaluation by points. Theoreticians stressed the fact that teachers, used to evaluation which is considered constant in determining the pupils' capabilities, will not treat scores as an aid in dividing children into groups and

in organizing compensatory activities. Discussion centered round the difficulty of evaluation, the score being sometimes considered too lenient and sometimes too severe. Many teachers asked whether the score in points can be a measure of school readiness. This, of course, resulted from identifying school readiness measured in points with over-all school readiness. Criticism of the evaluation technique was taken as a basis for working out the second version of the test, in which the technique was slightly changed.

Most problems, however, were connected with the time allowance, which was an hour and a half for every five children, i.e. about ten hours for the whole class. Difficulties appeared as far as school activities were concerned. In consequence, many teachers suggested shortening the test by reducing the number of items of the same type, paying no attention to the reliability which would thereby be strongly affected.

Parents' attitudes depended on their awareness of the purpose of the measurement. It often happened that parents, used to the evaluative function of school, treated the measurement of school readiness as an examination and feared its possible negative results. Moreover, parents are often convinced that their children have exceptional abilities, and informing them of certain deficiencies in the level of a child's maturation is a very delicate matter. It should be done, however, so that full co-operation between parents and school may be established as early as possible.

Yet another important problem arises from the fact that many parents use the idea of testing as a form of threat for their children. Considering it proper for the formation of attitudes toward school and learning, they threaten their child with early enrolment "which will reveal all their shortcomings".

Although a misunderstanding of the purpose of measurement makes some parents reluctant for their children to participate in compensatory activities, these are usually gladly accepted and the percentage of those not availing themselves of the possibilities open for every child is insignificant.

Generally speaking, reaction against the innovation took the form of opposition to:

testing as a research technique (researchers),
testing as a technique likely to jeopardize other previously used techniques (psychologists),
financial aspects of measurement (local education authorities),
test administration and establishing compensatory groups (schools and teachers),

emotional experiences resulting from treating measurement as an examination (parents and children).

At the present stage, reaction against innovation springs merely from a lack of understanding as far as the importance of children's preparation for school is concerned. The Institute for Education has, however, analysed carefully all reservations on tests and testing as well as all positive opinions, the data being systematically used for improving the educational influence exerted on children upon entering school.

3. DIFFUSION

In August 1971 the Minister of Education issued an ordinance concerning enrolment in grade I of the primary school. This ordinance lays down that the enrolment is to be organized in the period from 31 December to 31 January. Special educational activities are to be organized for all the children found to be not fully ready for school. Payment for each hour of these activities will be equal to that for kindergarten instruction, while the person in charge of the activities, i.e. usually the head teacher of the primary school, will be awarded a special extra payment. The child's school readiness is to be assessed by means of the test constructed and standardized in the Institute for Education. One of the three statements listed below should express the opinion of the enrolment committee:

- the child is able to start school learning (no reservations),
- the child is able to start school learning if special suggestions as to educational activities are followed,
- the child should be examined by specialists in the educational advisory centre to decide what compensatory, medical treatment or rehabilitation should be undertaken.

Enrolment should be carried out by the head teacher of the primary school, class teacher of the future grade I, school doctor and possibly also the kindergarten teacher. The enrolment will ensure a proper, well-co-ordinated educational influence of the kindergarten and the primary school in the last year of the pre-school education and provide educational care for non-kindergarten children. Activities for non-kindergarten children will be organized either at the kindergarten or at the primary school. Groups of 5 to 15 children should be formed, working nine hours a week during the period of six months. A curriculum for activities of this kind will be issued by the Ministry of Education, while the work itself will be organized either by the kindergarten teacher or by the future

class teacher of grade I. The head teacher is responsible for the total course of the preparatory activities.

The ordinance had to be followed by further activities aiming at the full preparation of primary schools for the innovation.

In November 1971, as many as 500,000 copies of the test were issued, so that the early enrolment could take place at the end of December. The output corresponded to the total number of children to be enrolled in grade I in September 1972. At the same time, in-service training was started for the primary school teachers. Numerous articles on the subject were published in the educational press which were designed for kindergarten and primary school teachers as well as for instructors from the local centres for teaching methods and in-service teacher training. Dr. Barbara Wilgocka-Okon, who was in charge of the research project, prepared a popular brochure entitled *How to assess school readiness*, in which theoretical foundations of research on school readiness were discussed as well as the organization of early enrolment, testing for school readiness and carrying out compensatory educational activities. The brochure was published in November 1971 in a sufficient number of copies to provide each primary school with at least one copy. Several courses were also organized for the staff of the centres for teaching methods and in-service teacher training. Thus, the measurement of school readiness was widely and successfully popularized.

What became an important part of the project was *The curriculum for educational work at compensatory courses* prepared and published in the year 1972. This document makes clear the significant part played by the pre-school centres responsible for compensatory courses as an element of the whole compensatory system which makes it possible to create better conditions for the school start. The main tasks of these centres are to conduct a many-sided observation of the child, pointing out developmental hindrances and analysing environmental conditions; and to raise the level of school readiness in children who have never attended kindergartens and who show a low level of school readiness.

At the first stage of the child's participation in activities provided by the centre, attention is focussed on getting to know the child and finding sources of his difficulties through the school readiness test and other methods of measurement. Sometimes additional examination in psychological advisory centres proves indispensable. Individual curricula for compensatory activities are consequently prepared for all the children.

In view of the widely differing levels of intellectual, emotional and sensory-motor development, individual work with the child is stressed as the most important element of the activities. A sound individual diagnosis is especially significant for its proper conduct.

An important role is also played by group work, which is usually started with very small groups of children and then extended to bigger numbers of children. In this way, the formation of social attitudes is achieved as well as the formation of skills to co-operate in both play and work.

In the activities of the centre, attention is also paid to establishing proper contacts with the child's home environment. Close collaboration with parents gives valuable aid in eliminating developmental shortcomings and fostering satisfactory all-round development. Various forms of collaboration have been introduced. Most widespread among them are individual contacts, although it is a usual practice to call parent-teacher meetings in order to discuss common problems of a homogeneous group of children with a low level of school readiness. Methods of eliminating difficulties are presented at the meeting and possibilities of taking effective measures for the purpose in particular homes are analysed.

Each centre is required to plan its activities in close collaboration with the primary school. The point of this lies not only in bringing children close to their teacher in grade I and providing the teacher with all the necessary data concerning their developmental level but also in bringing them close to school itself. Children from the centre are often engaged in some of the activities organized by the school, and participate in shorter trips and school ceremonies. Thus, a traditional gap between the kindergarten and the primary school disappears, the educational process being viewed as a continuum not only by teachers but also by children themselves.

4. WHY THE EARLIER SCHOOL START ?

The problem of the earlier school start was still open. Although research results obtained in the Institute for Education provided a number of arguments for the enrolment of children who reached the age of six by the end of June, the implementation of the postulate encountered numerous obstacles.

Demographic depression following the post-war explosion was certainly a favourable factor. In the period 1967-1980, the number of primary school pupils will decrease from 5,700,000 to 4,260,000,

i.e. by 100,000 per year. This will considerably improve learning conditions in urban areas, especially as far as the teacher-pupil ratio and out-of-school activities are concerned. The decrease in the number of rural children will, however, make it necessary to close some primary schools. A gradual lowering of the school starting age by two months each year would, however, preserve many of the rural schools.

There is also an urgent need to bring rural children within the school's educational influence as early as possible in order to minimize the period of influence of an environment which is often far from desirable. Furthermore, the earlier school start would stimulate the establishment of institutions of pre-school education in rural areas.

All the above-mentioned arguments were used in the course of the nation-wide discussion on the subject which took place in 1971. The discussion was stimulated by the guidelines for the VIth Congress of the Polish United Worker's Party, where the problem was given considerable attention. The majority of participants, researchers, teachers and parents were in agreement that the age for starting school should be lowered by six months. It was pointed out that properly organized in-service courses would be needed for teachers who were to be charge of early enrolment and the necessity of modifying curricula and teaching methods and modernizing school equipment was stressed.

Participants who spoke against the earlier school start referred to the insufficient level of school readiness in some six-year-olds, especially those from the rural areas. They stressed the inadequacy of existing curricula and handbooks, as well as the lack of kindergartens and other institutions of pre-school education.

All these views will be discussed in the report on the state of Polish education which is now being prepared by the Committee of Experts. The Committee will also work out model solutions for the education system, the most important of which seem to be the popularization of secondary schooling, the development of pre-school education and the earlier school start. Final decisions as to the organization of schooling will be made in 1973.

Among various arguments in support of the earlier school start, those relating to the social aspects of the problem seem to be the most important. Whatever the research results, it is evident that more and more parents are applying for permission to enrol their six-year-olds in grade I of the primary school. The trend is particularly marked in urban areas. Permission is granted by education

authorities only when a positive opinion is expressed by a physician, psychologist and educator. This does not seem to be the best solution, however, because of a great discrepancy in maturity between six- and seven-year olds. Although their level of intellectual development is similar, considerable differences can be noted in behavioural patterns, and this creates additional difficulties for group interaction. Observation of six-year-olds revealed that they are livelier but also more susceptible to tiredness. It was also noted that their working speed and ability to concentrate are lower. This, however, will not prevent them from performing the learning tasks in grade I provided proper educational measures are undertaken. All the above-mentioned observations were carried out in classes for six-year-olds. Experimental classes of this type were established in primary schools Nos. 141 and 234 in Warsaw, and No. 2 in Żyrardów, as well as in some other towns. Experimental work on the problem of the educational influence of the kindergarten on the school success of six-year-olds is also being carried out in school No. 103 in Nowa Huta.

Interest in the early school start varies with the environment. In the rural regions, for instance, there is no urge to start school early, due to such reasons as the children's help on farms, their narrow range of interests or the distance between school and home. The disparity in children's living conditions in rural and urban areas calls for measures on the part of educational authorities in order to eliminate the differences and to provide equal educational opportunity for all. This can be achieved by providing early compensatory activities for children from less favourable types of environment.

The problem, however, is to determine when activities of this kind should be started, i.e. what should be the age for entering school. Research carried out in the Institute for Education revealed that the level of school readiness in six-year-olds (28.1) is not so much lower than that of seven-year-olds (33.4) as not to permit school instruction. Here again the difference between urban and rural areas was clearly demonstrated, the difference between six-year-olds amounting to 7 points and between seven-year-olds to 5 points. For this reason an additional group of six-and-a-half-year-olds was established in the data processing. This group was shown by statistical analysis to be the best able to meet school requirements. Even in this case, compensatory activities should not be discontinued upon school entry, since without them differences caused by the environment are again reflected in the course of

school instruction, 90 per cent of urban children being found to face school instruction successfully as compared to 70 per cent in rural areas.

The conclusions of the research seem to suggest no more than cautious innovation. Thus, the project pertained to the enrolment of all children reaching the age of six by the end of June. All the children should be subjected to a detailed psychological and medical examination in order to assess the level of their school readiness and provide indicators for the curriculum of compensatory courses. Proper educational care should also be provided in the pre-school period. This function can be fulfilled by kindergartens or introductory classes where attention would be drawn to cognitive activities, social attitudes and patterns of behaviour indispensable for social interactions. Data obtained by the Institute point out that the optimum period between school readiness assessment and school entry is approximately a year, since this is the length of time necessary to complete the most important compensatory activities successfully.

The earlier school start will have a considerable bearing on the organization of educational work at school. Both teaching material for grade I and methods of instruction should be carefully revised. Organization of lessons and especially their length have to be changed. The over-all system of educational activities should be adjusted to the needs and abilities of six-year-olds. This would require the co-operation of psychologists, educators and physicians as far as all the necessary innovations are concerned.

All these changes in educational activities call for a new type of pre-service teacher training so that future teachers have a better knowledge of developmental psychology and so are able to use children's capabilities to the full without overburdening them with tasks which are too difficult.

The earlier school start also gives rise to a number of new problems. Many of them, however, such as the reform of initial instruction or the reform of pre-service teacher training ought to be dealt with in any case.

It should be added that the earlier school start will not be hindered by demographic factors. According to the prognosis by the Planning Committee for the Council of Ministers, the decrease in the number of schoolchildren is going to continue till the year 1978/79, while the future increase will not exceed the numbers reached in 1973/74.

Moreover, there is no danger that pupils will be leaving the primary school too early, since the coming reform will extend the learning period.

In the light of all these facts we can expect that full utilization of children's developmental capabilities will be made possible by the introduction of the earlier school start, the solution of all other problems depending entirely on the quality of the education system.

It must be stressed that the campaign in question is only one of the numerous examples of innovation introduced in the education system of the Polish People's Republic. In comparison to the activties described here, the introduction of compulsory secondary education by the year 1980, which was announced by the First Secretary to the Polish United Workers' Party, Mr. E. Gierek, will be an enormous enterprise, not to mention the reform of vocational schooling and the anticipated growth of higher education. It is worth bearing in mind that all these efforts are being made in a country which was devastated more than any other thirty years ago but where educational innovation is now made possible by a system in which the postulate of a country of educated people is being confirmed in everyday life.

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Q U E S T I O N N A I R E

(Please write 'yes' or 'no' in the box following each question. Further comments may be written on the back on this sheet.)

1. Do you consider the analysis made by the author in this study: -relevant? ☐ -objective? ☐ -adequate? ☐

2. As a result of this analysis, is the innovatory character of the project made sufficiently clear? ☐

3. Do you consider this case study is likely to:
   -help to improve the project under discussion? ☐
   -facilitate the design of new projects? ☐
   -isolate the elements of a theory of innovation? ☐

4. If you know of any project(s) in the same subject area as this case study which has been or is being carried out in your country that would contribute to our analysis of the innovatory process in this specific field, please give a brief indication of the type of project, place, persons responsible, bibliographical elements etc.

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